

# Maxilla to Mandible

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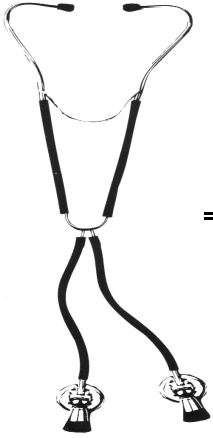
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## Editorial

Sleep is more than a time of rest when nothing happens. It is a dynamic behaviour during which important physiological changes take place, both in the brain and in the body. Sleeping can be as important to health as exercise. Not only does lack of sleep have serious impacts on both mental health (eg. anxiety and depression) and our ability to think and function well, it also can make us more likely to become ill and can make it more difficult to recuperate when we do.

During the workweek, almost two-thirds of all adult Americans get fewer than the recommended eight hours of sleep a night, according to the National Sleep Foundation.

Sleep loss is associated not only with decreased vigilance and depressed mood, but also with altered hormone production. Fragmented sleep results in reduced growth hormone secretion, and even partial sleep loss one night results in higher stress hormone levels the next evening. These effects result in decreased glucose tolerance and contribute to development of a pre-diabetic condition.

Recent research shows that elderly widows and widowers whose sleep is disrupted due to bereavement-related depression have increased levels of natural killer cells (NKC's), indicating a weakened immune system.

Getting enough sleep may increase our chances of defeating infection. Research with laboratory animals shows that an animal's ability to survive bacterial infection is linked to the amount of deep sleep (non-REM) the animal gets during the first 12 hours after being infected.

Total sleep deprivation can be fatal. An early study dramatically showed that after two weeks without sleep, laboratory animals lost weight despite eating more. At four weeks, the animals died, prey to an opportunistic bacterial infection.



## **The Immediate Effect of Changing Mandibular Position on the EMG Activity of the Masseter, Temporalis, Sternocleidomastoid, and Trapezius Muscles**

Previously, it was thought that mandibular position affects only the structures immediately surrounding the mandible, but recent studies suggest that there exists a close interrelationship between components of the craniocervical-mandibular system. This is due to the intimate anatomical and biomechanical connections that exist between these structures.

The craniocervical complex functions as one unit, and as a result, any change that occurs will have an effect on the entire system. There have been many studies that show how movements of the head affect mandibular postural positions. Moreover, changes in mandibular position, such as changes in occlusal contact pattern and vertical dimension of occlusion, affect both masticatory and cervical muscles. It is important to understand the interrelationship of the craniocervical complex because changes in mandibular position occur on an everyday basis.

The aim of this study was to examine the effects of changing mandibular position on the electromyographic (EMG) activity of the masseter (MS), temporalis (TM), sternocleidomastoid (SCM) and trapezius (TR) muscles. Thirty-three

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asymptomatic subjects (16 males and 17 females; ages 23-52) participated in this study. Intraoral appliances were used to temporarily alter the subjects' mandibular position.

Each subject received the following 2 removable mandibular full coverage acrylic appliances: (1) the REPOS (repositioning appliance) increased vertical dimension and midlined the mandible by aligning the maxillary and mandibular frena; (2) the NONREPOS (nonrepositioning appliance) increased vertical dimension in the habitual path of closure.

While the mandible was either in a relaxed open position (relaxed) or maximal voluntary clenching (fullbite) with the REPOS or NONREPOS in place, surface EMG recordings were obtained for all muscles bilaterally. REPOS significantly reduced EMG activity of all muscles bilaterally during fullbite.

During relaxation, REPOS reduced EMG activity of TR bilaterally. NONREPOS decreased the EMG activity bilaterally for TM and TR and unilaterally (left) for MS and SCM during fullbite. During relaxation, NONREPOS decreased EMG activity of TR and SCM bilaterally. Activity of TM was found to be reduced unilaterally.

J Craniomandib Prac 24: 237-244, 2006.

### Comparison of Doppler Sonography to Magnetic Resonance Imaging and Clinical Examination for Disc Displacement

Displacement of the articular disc in the temporomandibular joint (TMJ), or disc displacement (DD), is an abnormal relationship of the disc relative to the mandibular condyle, fossa, and the articular eminence. Headaches, limitation of opening, and joint sounds, including crepitation and clicking, are associated with pain in the TMJ and DD. Joint sounds are considered an objective sign of DD or degenerative joint disease, or a combination of the 2.

Joints sounds are not a definitive sign of DD, but in combination with a clinical examination, their detection could lead to a diagnosis of DD. The use of sound-enhancing equipment to detect TMJ sounds has been suggested. Doppler sonography works by transforming the ultra-sound echos generated by the turbulence of liquid (blood) flow to audible and visible sound waves. In the TMJ, Doppler amplifies both the blood flow in the superficial temporal artery

and vein and the frictional movements of the condyle-disc-fossa complex, so they are clearly heard.

This study was designed to evaluate the accuracy of Doppler sonography to detect joint sounds and to compare these findings with magnetic resonance imaging (MRI) and clinical findings. Thirty-seven symptomatic temporomandibular disorder (TMD) patients and 11 apparently healthy subjects were selected after they completed a questionnaire detailing TMD symptoms and treatment. All subjects had a vertical opening of at least 40 mm. On each subject, the clinical exam was done by a single investigator, and then an MRI of each TMJ was performed in the sagittal closed and open, and the coronal closed positions. Finally, the Doppler exam was done while the patient opened, closed, and performed lateral movements.

The clinical diagnosis, and Doppler diagnosis of DD were compared with the MRI diagnosis, with a sensitivity of 73% and 90% and a specificity of 70% and 49%, respectively. When only the asymptomatic subjects were considered, the sensitivity was 0% and 100%, and the specificity was 100% and 56%, respectively. In the symptomatic group alone, there was a sensitivity of 80% and 89%, and a specificity of 48% and 45%, respectively.

Thus, Doppler sonography seems to be a reliable tool for ruling out DD, particularly in symptomatic patients. However, the large number of false positives (low specificity) indicates that Doppler sonography should not be used alone as a diagnostic tool in healthy patients.

Angle Orthod 76: 824-829, 2006.

### Changes in Reported Orofacial Symptoms Over a Ten-Year Period as Reflected in Two Cohorts of Fifty-Year-Old Subjects

Interestingly, previous studies on incidence of toothache have reported that when oral health is improved, minor disturbances that were previously unnoticed become reportable problems. Bruxism and other signs and symptoms of temporomandibular disorder, including orofacial pain, increased over the 10 year period of this study. The authors feel that the increase in orofacial pain symptoms during the 10 year period is the most problematic finding, and should be further addressed by society and the dental community.

Acta Odontol Scand 64: 202-208, 2006